## Book Reviews

*The Audubon Society Field Guide to North American Butterflies.*
Robert Michael Pyle. 1981. 916 pages, 759 colored figures. Alfred A. Knopf, New York. Price: $11.95, paperback.

The best feature of this book is the superb color photos of butterflies in natural settings. Generally these show true colors and picture all North American species. However, a few figures depict rubbed, out-of-focus, or even "nature faked" specimens. One exasperating aspect is that only common names (some newly-invented) are given for the figure captions and text discussions. The photos alone are not always adequate to identify certain species of *Speyeria, Euphydryas, Euphilotes, Thorybes, Erynnis, Hesperia, Agathymus* and other taxonomic problem-genera.

The introduction stresses watching, photographing, and rearing butterflies and cautions against over-collecting. The text emphasizes description, similar species, life cycle, flight times, habits, habitats, and range. Entirely too much space is devoted to the descriptions and similar species. Because of the identification format, the organization is unorthodox. There is little mention of subspeciation which is rampant in the West. Hostplant data is accurate but skimpy. The style is variable, often captivating and drawing on a wealth of information, but sometimes verbose and redundant. It is not clear how much of the information is from Pyle's personal experience, the literature, or from others, as facts are not backed up by referencing. The habits, habitat, and conservation discussions are positive features. Special attention is given to migrant species and weedy species of disturbed habitats. The new Brown & Miller check list is followed rather disconcertingly in its generic splitting, and the commoner species' synonyms are mentioned. In the back there is a glossary of terms, picture credits, host plant index, and butterfly name index (common and scientific names combined).

Some important biogeographic information is scattered in the text. For example, *Neohasia* is related to the South American *Catasticta*, and *Neominois, Habrodais,* and *Hypaurotis* are related to East Asian species. *Strymon avalona* and *Boloria acrocnema* have the most restricted ranges of any Nearctic species, and *Plebejus neurona, Lycaena hermes,* and *Strymon avalona* are peculiarly endemic to southern California. *Vanessa tameamea* (Hawaii) is probably derived from the Asian *V. indica*, and another Hawaiian endemic, *Vaga blackburnii*, is related to a Bonin Islands species.

Ranges are generally accurate, but *Euptoieta claudia* and *Eurema mexicana* are not residents of Southern California, *Libytheana bachmanii* is not mentioned for Arizona and Southern California, and *Speyeria callippe* is not mentioned for Southern California. Under *Speyeria edwardsii*, "Of the western fritillaries, this is the only one which varies constantly throughout its range," is a misstatement.

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The color photos in this book are superb, and make the book worth the price. The photos are mostly of living butterflies in natural surroundings. The text is suitable

for the novice butterfly enthusiast, and has the virtue of giving a description, life cycle, flight, habitat, and range for most species.

The book also has shortcomings and numerous errors. Identification is made more difficult by four drawbacks: a) at least 27 photos are misidentified (correct names are: 326 & 337 *P. polyxenes*, 89 *C. interior*, 108 *P. agarithe*, 127 *K. lyside*, 516 *L. helloides*, 457 *I. niphon*, 430 *C. apama homoperplexa*, 509 *C. argiolus*, 543 *C. nemesis*, 553 *E. ares* female, 365 *L. bachmannii larvata*, 607 left *S. coronis halcyone*, 613 left *C. bellona*, 590 *P. campestris* female, 368 left *P. zephyrus*, 368 right *N. vau-album*, 654 *A. iphicla*, 759 *H. guatemalena*, 758 *H. februa*, 686 *S. blomfildia*, 663 right *A. leilia*, 662 right *A. celtis*, 732 *O. taygete*, 735 *O. jutta*?, 285 *T. confusis* female, 165 *O. sylvanoides*—the black pages make correcting these errors difficult—one must use "Liquid Paper" to whiten a space for inking); b) many photos are of butterflies in postures that make them unidentifiable (upperside instead of underside, or vice versa, or a view showing only the body such as photos 205-210, the diagnostic spot of *A. belli* is hidden by the HW on photo 199, etc.) so individuals of these species cannot be identified; c) many species have no photo, and are illustrated by line drawings in the text, which are generally small, rather faded, and poorly drawn; d) many species have no photo or drawing, and are mentioned only in 1-2 lines appended to another species. Photos 116, 323, 380, 381 and 475 seem to represent dead butterflies. It will evidently take many more years to accumulate good photos of all the North American butterflies in a living state. The photos are sorted into 14 groups based on rough appearance (the white butterflies are mostly grouped together for instance, although the white forms of *Colias* are shown with the yellow butterflies). The grouping of many species is debatable, although the amateur may find this feature of the book useful. There are only three photos per page, so considerable flipping through the small book is necessary to find the right photo. These deficiencies in the photos mean that only the visually distinct species will be able to be identified using the book, and species that are similar to others cannot be identified to species.

The photos give only the common names, many of which are new, so to determine the identity of them one must turn to the text. Most traditional common names are retained, although many are new, and some new ones are unfortunate (for instance the "Sheep Skipper", *A. ovinia*, is named for the Navajo Indians' sheep, but actually *A. ovinia* inhabits extreme southern Arizona; the Navajos inhabit northern Arizona).

Another limitation is the coverage of the book. Five hundred seventeen species are illustrated in color (excluding those misidentified), 61 in line drawings, and the remaining about 122 of the 700 North American species are not illustrated at all. Only about 600 of the 700 species have full treatment in the text. Two widespread native species, *Euphilotes spaldingi* and *Cogia outis*, and about 30 strays to the United States from Mexico or the Antilles, are not mentioned at all. *Pseudolycaena marsyas* does not occur in the United States.

The text is adequate, although numerous errors detract from its value. The generic names used in the book are highly split, many familiar names such as *Papilio glaucus* and *Pieris rapae* falling by the wayside. Some species names are doubtful (*Calephelis "guadeloupe"* a synonym of *nemesis*, *Euphyes "ruricola"* a nomen dubium, *Celastrina ebenia* a synonym of *C. nigra*, *Agriades "franklini"* is *A. glandon*, *L. astyanax* a ssp. of *L. arthemis*, etc.).

Many larval foodplants are errors. Some plants are lab hosts only, and are doubtfully used in the field (*Heracleum* for *Papilio joanae, Trifolium* for *Phoebis sennae, Eurema lisa* and *Zerene eurydice, Muhlenbergia* for *Lethe anthedon, Althaea* for *Celotes nessus, Stenotaphrum* for *Nastra julia, Prosopis juliflora* for *A. palmeri, Poa, Avena* and *Cynodon* all for *Amblyscirtes vialis*). *Thlaspi* is refused by *Pieris napi* larvae. *Horkelia* and *Potentilla* are doubtful for *Lycaena xanthoides editha. Polygonum douglasii* applies to *Lycaena nivalis*, not *L. mariposa*. The *S. macfarlandi* host is *Nolina texana*, not *microcarpa. Ceanothus macrocarpus* is now *megacarpus* for *S. saepium. Myrica* is refused by *Calycopis cecrops* females and larvae. *Trema floridana* is now *micrantha* for *S. martialis. Salicornia ambigua* is a synonym of *virginica* for *B. exilis. Hosackia purshiana* is dubious for *Plebejus emigdionis. Castilleja* is an error for *C. palla. Ulmus* is an error for *P. zephyrus, Rhododendron* an error for *P. oreas. Sorghastrum nutans* is dubious for *N. areolata. Asclepias* is unverified for *Danaus eresimus*. The *E. zestos* host is a herb, not woody. *Canna* is an error for *O. proteus*. The *A. anaphus* host is "wild bean," not *Phaseolus. Malva, Abutilon* and *Althaea* plants are based on H. Tietz' "*syrichtus*" and apply to *P. communis*, not *P. oileus. Malva* is an error for *P. catullus*. The host of *Euphyes dion, Scirpus*, is a bulrush (Cyperaceae), not a rush (Juncaceae). *Sorghastrum nutans* and *secundum* for *Amblyscirtes hegon* are somewhat doubtful, based on Abbot. *Agathymus neumoegeni* larvae do not feed in roots as stated. Certain plants are misspelled throughout: *Dryapetes, Saccharum, Gaultheria humifusa, Porlieria, Rumex triangulivalvis ("triangularis"), Quercus gambellii, Cuscuta, Rivina, Lippia graveolens, Prunus havardii, Stenandrium.*

Few hibernation stage records are given, and nearly half of those given are wrong. The correct stages are: *Colias philodice* and *eurytheme* 3-4 stage larvae, *Lycaena phlaeas* and *cupreus* half grown larvae, *Lycaeides melissa* half grown larva, *S. hydaspe* newly hatched larva, *Erynnis baptisiae* probably mature larva, *Hesperia comma* egg, *H. metea* mature larva, *Polites mystic* 4th stage larva (see *J. Res. Lepid. 18*: 171-200).

The larva and pupa descriptions are mostly adequate, although brief. The *Panoquina panoquinoides* larva and pupa descriptions refer to *P. errans*. The descriptions of larvae and pupae of *Erynnis* are poor and are repeated almost verbatim for most of the *Erynnis* species, including several species that have never been reared.

The ranges are mostly correct although often underestimated. However, some regions stated are errors: *P. pilumnus, Z. eurydice, C. definita, C. perditalis* and *C. mossii* do not occur in Arizona, *H. charitonius* is not a resident in South Carolina, *P. orseis* is not in NE Nevada, *T. leanira* is not in E. Colorado or New Mexico, *Z. cyna* is not in New Mexico, *E. favonius* is not in West Virginia or Louisiana, *C. sheridani* is not in Saskatchewan, *C. hesseli* is not in Mississippi, *H. grunus* is not in Idaho or "coastal Arizona", *L. xanthoides* is not in the Great Basin, *L. phlaeas* is not in Florida, *C. occidentalis* is not in Alaska, *A. pima* and *P. rudkini* are not in SE Utah, *P. beckeri* is not in Black Hills, *P. hylas* is not in W. Nebraska, the *P. zephyrus* record from Manitoba was a misdetermination. *P. progne, P. oreas* is not in NE Wyoming, *C. henshawi* is not in W. Texas, *N. areolatus* is not in Kentucky, *P. araxes* is not in S. Texas, *P. manueli* is not now in Florida, *P. mercurius* records from Arizona-New Mexico are errors, *U. teleus* and *A. toxeus* and *G. gesta* records from Arizona are errors, *E. persius* is not in Maritimes, *P. alpheus* is not in Oregon, *N. julia* is not in

Alabama, *H. dacotae* is not in Illinois, *H. sassacus* is not in Tennessee, *H. attalus* is not in Nebraska or Wisconsin, *P. origines* is not in Montana, *P. zabulon* is not in Wisconsin, *P. taxiles* is not in Nevada, *P. viator* is not in Maine, *P. hobomok* is not in the Sangre de Cristo Mts., *A. aesculapius* is not in Connecticut or New Mexico, *M. cofaqui* is not in N. Texas.

Some sedentary species are wrongly listed as strays (*C. goodsoni, P. errans, Agathymus* ("Brown Bullet") *estelleae, Pholisora mejicana*), and *Heliconius erato* is treated as a native with no mention that it is actually a very rare stray.

The flight periods listed are mostly correct (although *N. terlooti* flies in June-July also, *Colias alexandra* has two broods on the plains, *Boloria eunomia* has a several week flight period (not 4-5 days as stated), etc.). The number of broods for multivoltine southern species are underestimated throughout the book (*Eurytides marcellus* has 3-4 broods from April-October, not two, for instance); in many cases when only two broods are listed the number of generations per year is probably four or more.

The introductory material gives very elementary information for the beginner on anatomy and the life cycle, etc. Concepts such as photoperiod do not appear in the book. Flowers visited by adults, and adult migrations, are listed. There is nothing on mate-locating behavior in the book, although anecdotal reference to territoriality are given throughout the book, although the application of this concept to butterflies is disputed by research workers. Pheromones are attributed to *T. elada, S. hydaspe* and *L. creola*, when really they have never been studied. The white female form of *Ascia monuste* also migrates. *Colias behrii* is a subalpine, not an alpine, species, and the definition of alpine in the glossary ("pertaining to or inhabiting mountains") is peculiar.

Overall, the photos are excellent, and the text is suitable for the beginner, but the numerous errors mean that the book must be used with caution by lepidopterists.

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*Butterflies of the Rocky Mountain States*
Ferris, C. & F. M. Brown, eds., with 8 contributors (F. M. Brown, D. Eff, S. L. Ellis, C. D. Ferris, M. S. Fisher, L. D. Miller, J. A. Scott and R. E. Stanford). 1981. 442 p. Univ. Oklahoma Press.

This book should serve a useful purpose in allowing the identification of Rocky Mountain (exclusive of Canada and Alaska) butterflies and skippers, and presenting their distributions, and a little about their foodplants and habits. Overall, it is a good book, especially for distribution and identification. It does contain some errors, however. I have studied Rocky Mountain butterflies for 23 years, and hope these comments will be useful to Lepidopterists who use the book as a factual source.

The maps are the best feature of the book, and represent a considerable amount of effort by Stanford (and the reviewer); the one drawback of the maps is that the dots are placed in the middle of each county rather than at the exact collection site, which makes the ranges in mountainous and other non-uniform areas appear too large in many cases. The county lines usually run along the top of mountain ranges, so two